

Summary of IPv6 Day on the NTT-NGN

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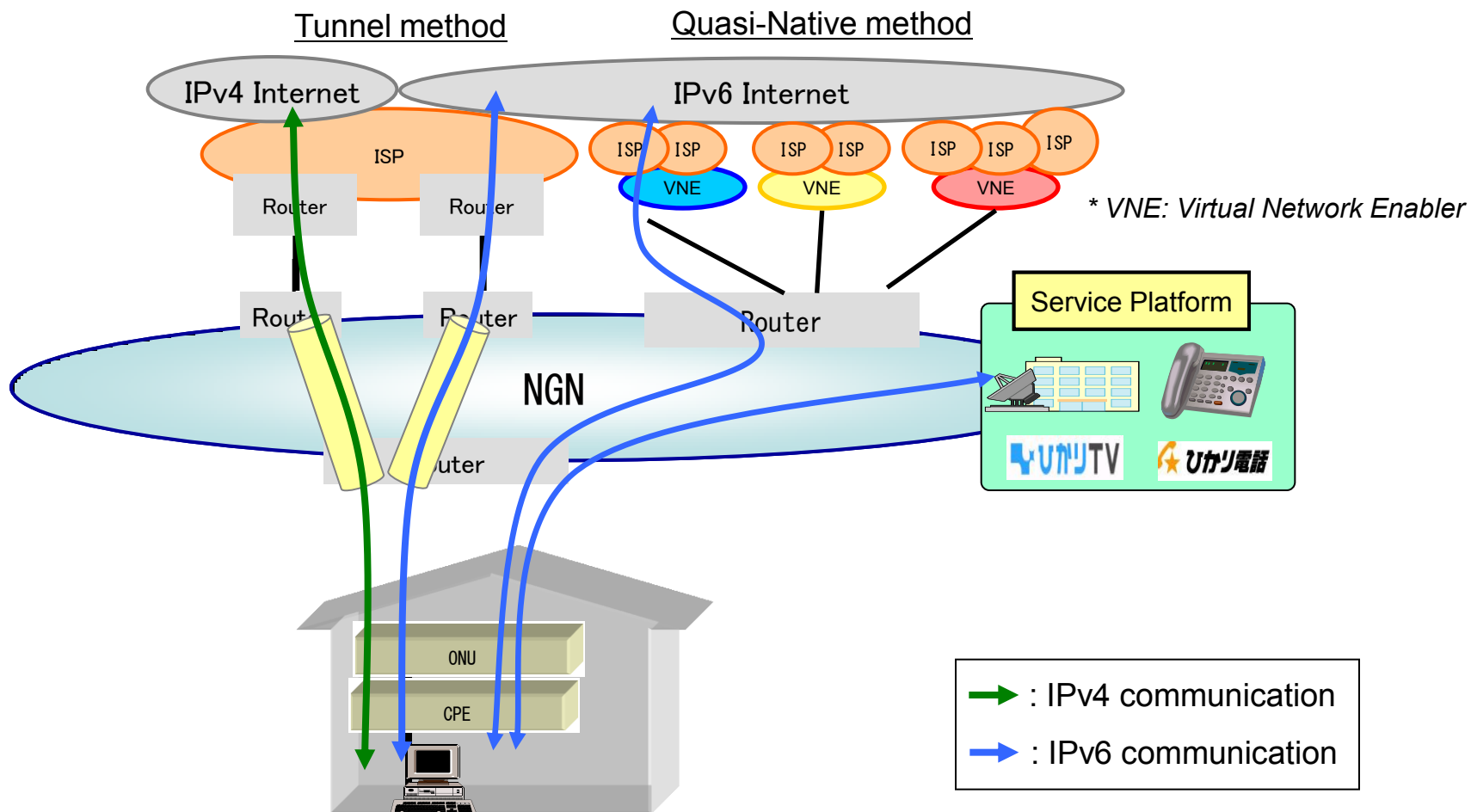
- NTT-NGN
 - About the NTT-NGN

- World IPv6 Day in Japan
 - Before the IPv6 Day in Japan

- NTT Investigate for the IPv6 Day
 - Measurement & Analysis
 - Measures & Consideration

Description of NTT-NGN

- NGN is constructed as IPv6 closed network
- NGN is used NTT's services: video delivery, QoS based IP telephony...
- NGN have a function as transit network from users to the Internet



Concerns:

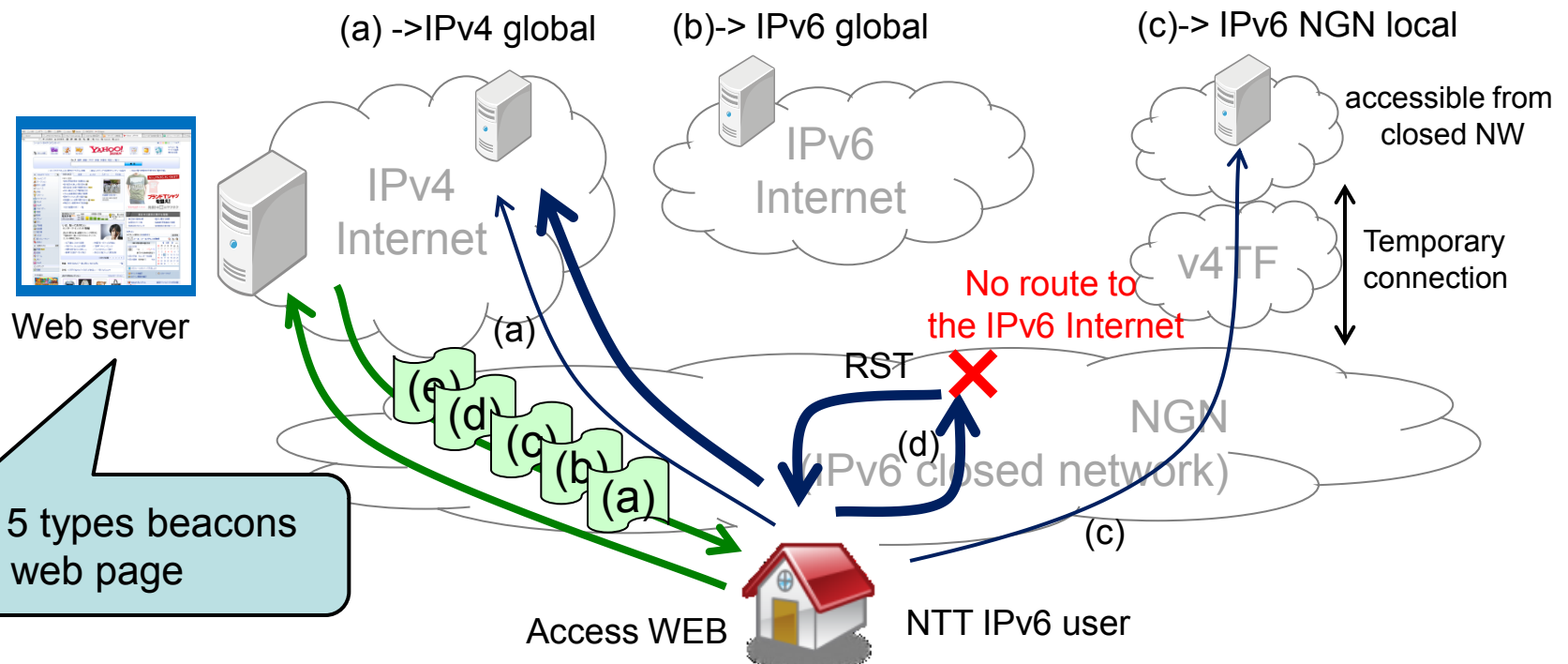
- IPv6 to IPv4 TCP Fallback cannot run correctly
 - 5% of all users cannot access to web sites correctly

Approach:

- NTT
 - build up TCP Resetter
- ISPs
 - introduce AAAA filter
- Customers
 - apply RFC3484 tool

Summary of Investigation

- NTT East investigated with IPv6 Promotion council JP
 - Set different type beacons in a page and track reachability to the 4/6 pages
- | | | |
|----------------------------------|---|--------------------------------------|
| (a). beacon A (IPv4 global) | } | (a).(b).(c) <stand alone beacon> |
| (b). beacon B (IPv6 global) | | Classify users |
| (c). beacon C (IPv6 NGN local) | | |
| (d). beacon D ((a) & (b)) | } | (d).(e) <dual-stack beacon> |
| (e). beacon E ((a) & (c)) | | Check the influence of adapting IPv6 |



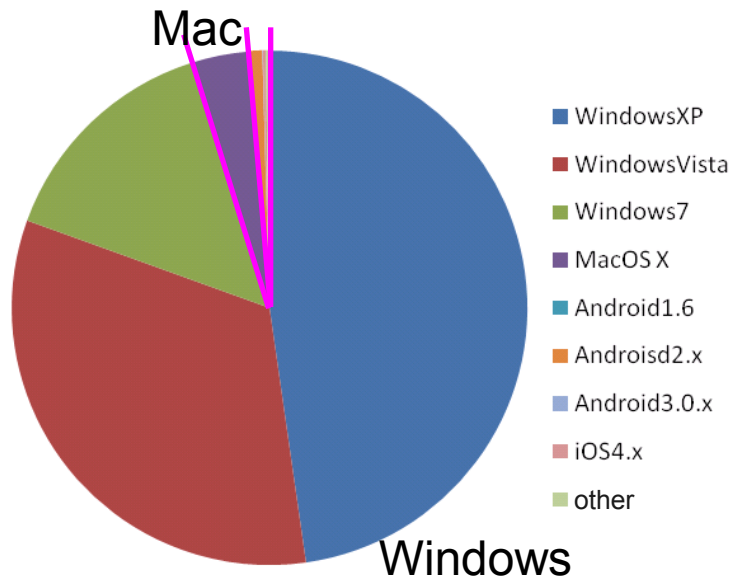
Result of Investigation

- Most of all users success fall back
- 0.2% of all users couldn't access WEB

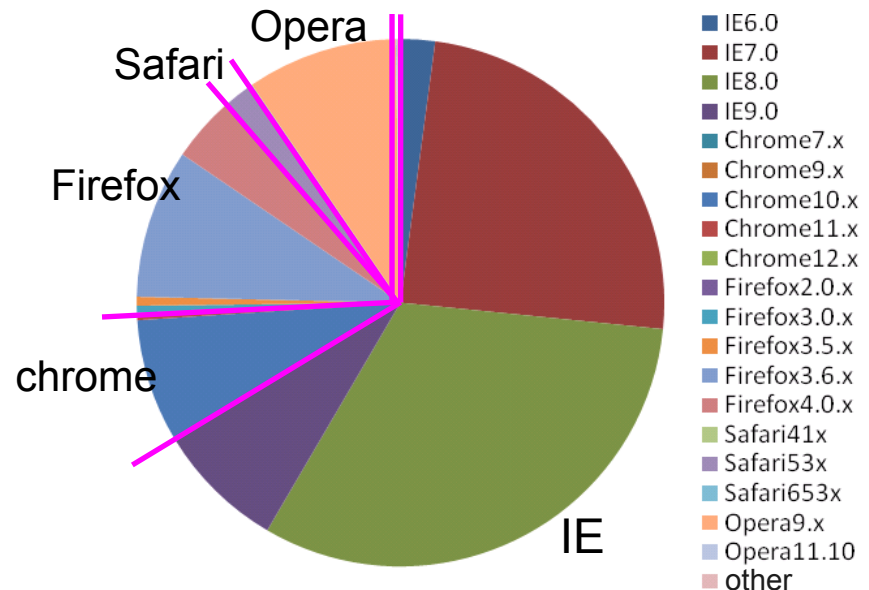
< NTT-NGN users of all failures >

- 68% of all failures couldn't access with using applications which have unstable implementation around fallback.

(Fallback failure ratio in NGN users/ OS type)

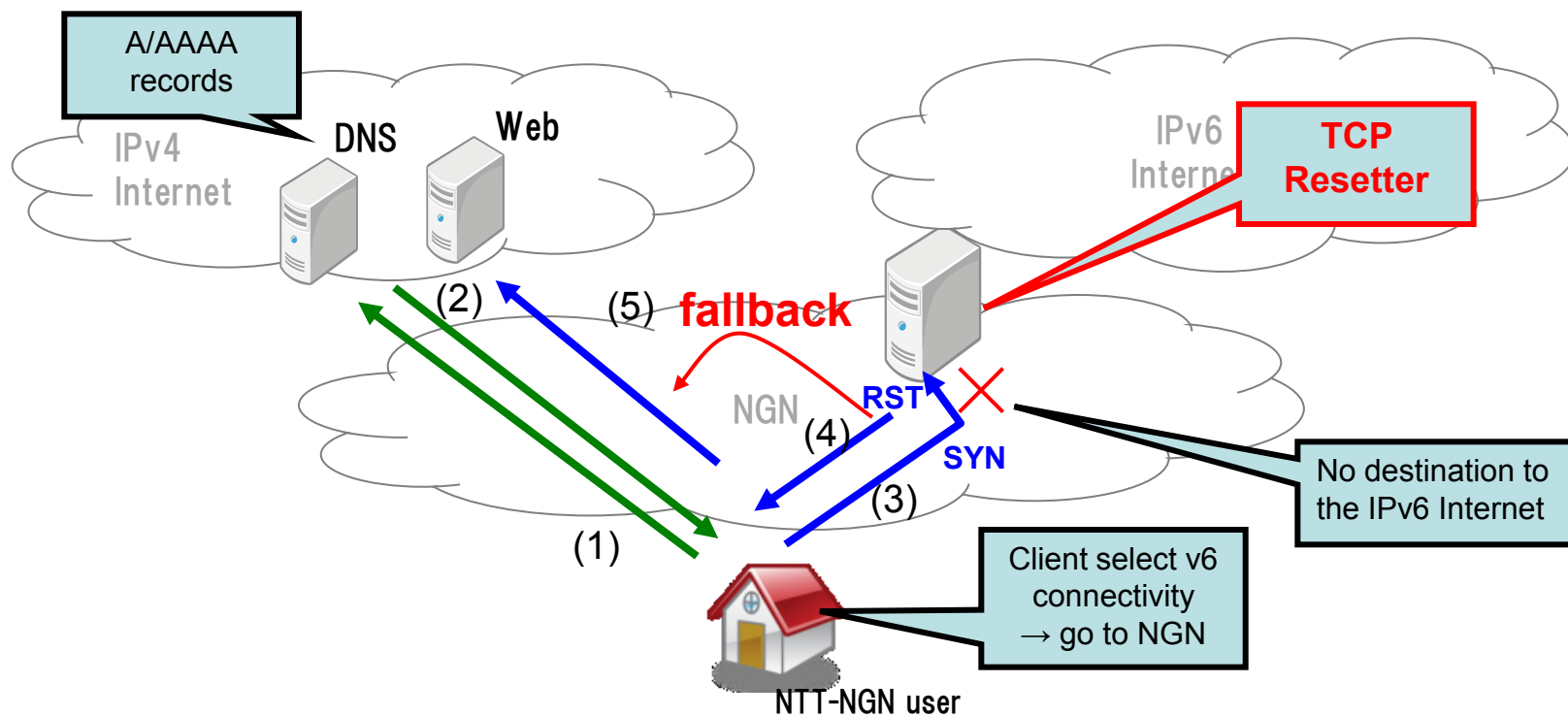


(Fallback failure ratio in NGN users/ browser type)

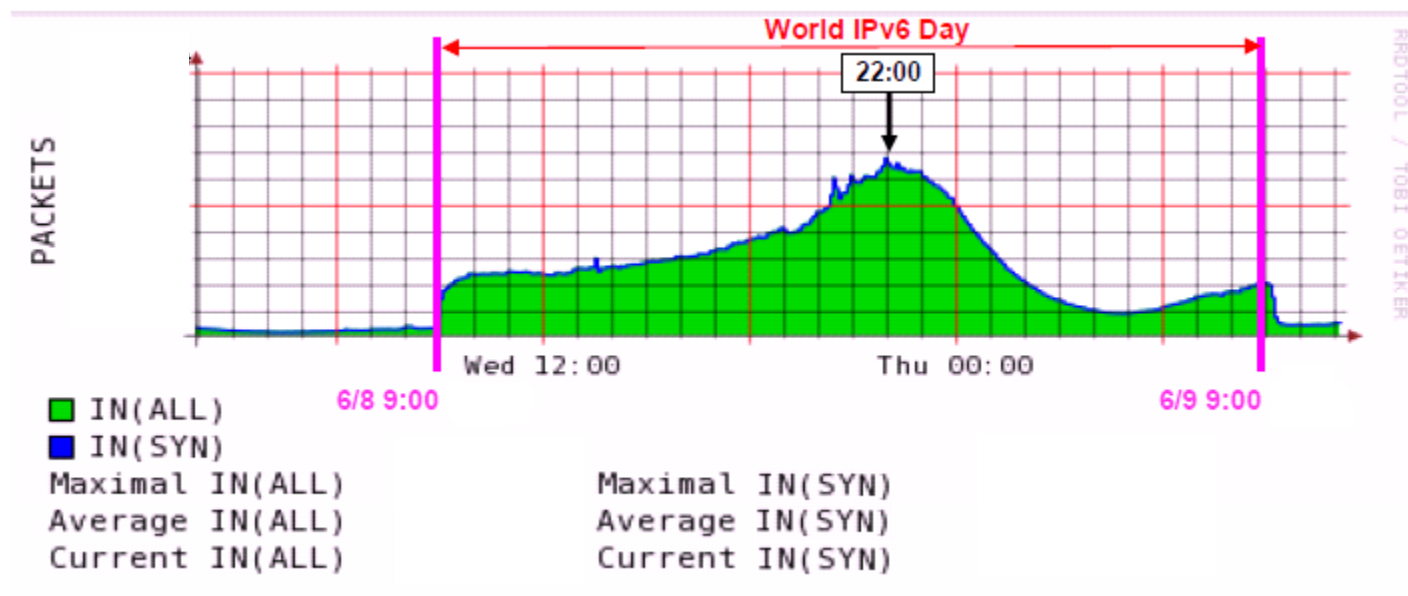


NTT's Measures

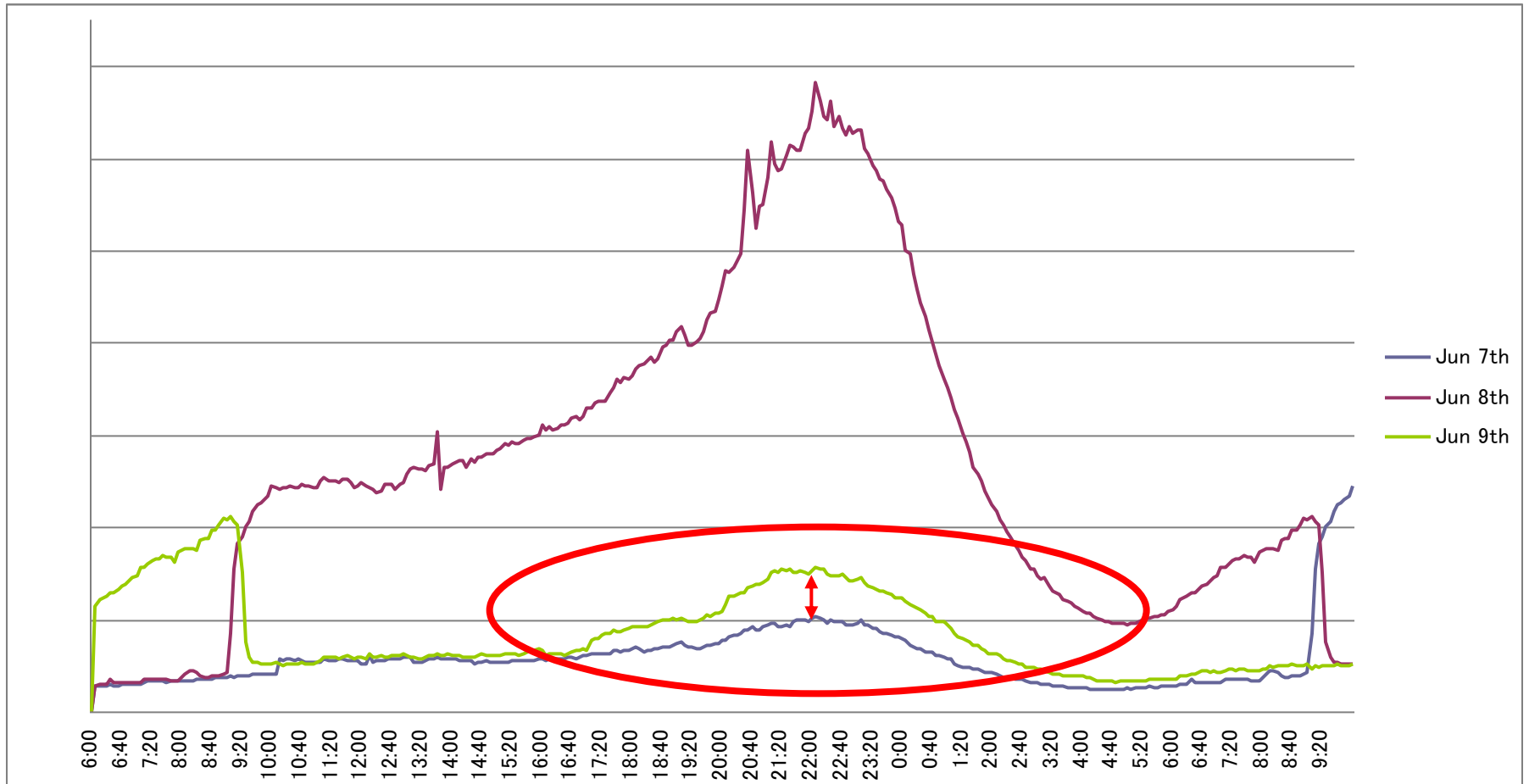
- NTT-NGN sends TCP RST when it receives TCP SYN
 - NTT set up TCP Resetter
- NTT build up TCP Resetter



- 7 times SYN packets were observed
- Peak time is 22:00 JST (traffic peak is around 24:00 JST)
- Response to the SYN packets were perfect



TCP SYN Packets data (TCP Resetter)



- NGN has no trouble at IPv6 Day
 - No serious network trouble
 - No serious users' reports

- NGN adapt to IPv6 Internet
 - Introducing TCP Restter is comfortable solution

- Fallback will still occur
 - Correspondence
 - Network side:
 - TCP Resetter support quick fallback
 - Application side:
 - Improve applications
 - Almost all their unstable implementation

- Task
 - Users need to update some apps or install some tools
 - Apply RFC3484 tool

- ⇒ Network and Applications improve their problems
 - Network: adapt TCP Resetter
 - Application: should check and update around fallback implementation